

REMARKS

The Office action of March 26, 2004, has been carefully considered.

Applicants' attorney is appreciative of the interview granted by the Examiner on July 22, 2004. At that interview, Applicants' attorney proposed language to better define the surface of the gas injection device, and the Examiner indicated that such language would likely distinguish over the structure shown in the Montgrain reference.

Claims 17 through 23, 26-35 and 37 through 39 have been rejected under 35 USC 102(b) as anticipated by Montgrain, and alternatively under 35 USC 103 over Montgrain, while Claims 36 and 40 have been rejected under 35 USC 103 as obvious over Montgrain in view of Manabu et al..

Independent Claims 17, 34 and 37 have now been amended to as discussed at the interview to recite that the orifices of the invention are disposed on substantially planar surface without protuberances or discontinuities. This amendment is in accordance with the embodiment of the invention shown in Figure 2 in which there are no protuberances or discontinuities, and described in the specification at page 9, line 8 through page 10, line 5. New claim 41 has been added to recite a device in which the wettability is the sole means for controlling the emitted bubbles.

The invention as now claimed clearly differs from Montgrain, in which a plurality of orifices is disposed on top of protuberances.

Indeed, it is clear from a complete consideration of Montgrain that some discontinuity must be present in order to control bubble size.

At col. 2, lines 39-50, Montgrain states that "[b]y use of protruding gas nozzles of small diameter (or other minimum

transverse dimension) the lateral spread of the incipient gas bubbles is limited and in consequence the gas bubbles overcome the resistance of metal surface tension while the volume of the individual bubbles is at a small and relatively controlled size. Provided there is adequate spacing between the protruding nozzles to avoid contact between incipient bubbles emerging from adjacent nozzles, and provided the extent of the protrusion of the nozzles is sufficient, the size of the bubbles is controlled by the minimum transverse dimension of the outer end of the protrusion.

Further, at col. 5, lines 18-26, Montgrain states "[t]he periphery of the top surface of each protrusion or edges of each rib constitute an abrupt discontinuity to check or hinder further lateral movement of the metal/gas interface across the surface of a diffuser plate or other structure. Instead of providing gas orifices in outwardly extending ribs or protrusions, bubble growth-hindering discontinuities may be formed by the peripheries of discrete recesses arranged between gas orifices in an otherwise continuous surface.

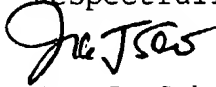
Thus, while Montgrain does disclose some materials which may be wettable, he does not disclose or suggest that wettability may be used to control bubble size. Even Fig. 10, cited by the Office Action, which shows ribs on which there are multiple orifices, also shows discontinuities at the rib edges.

In every embodiment of Montgrain, there is some discontinuity in the surface of the device to control bubble size, and there is no disclosure or suggestion that the wettability of the surface can be used to control bubble size.

As the invention as claimed is not disclosed or suggested by the cited references, withdrawal of these rejections is requested.

In view of the foregoing amendments and remarks,
Applicants submit that the present application is now in
condition for allowance. An early allowance of the
application with amended claims is earnestly solicited.

Respectfully submitted,



Ira J. Schultz

Registration No. 28666

LAW OFFICES
DENNISON, SCHULTZ, DOUGHERTY & MACDONALD
SUITE 105
1727 KING STREET
ALEXANDRIA, VIRGINIA 22314-2700
703 837-9600